# THE DATASHEET OF

# SUD35N05-26L-E3

# N-Channel 55 V (D-S) 175 °C MOSFET

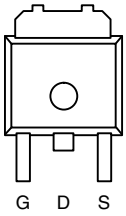
| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DS}$ (V) | $R_{DS(on)}$ (Ω) | $I_D$ (A)[a] |
| 55 | 0.0200 at $V_{GS}$ = 10 V | 35 |
| | 0.0260 at $V_{GS}$ = 4.5 V | 30 |

## FEATURES

- TrenchFET® Power MOSFETS
- 175 °C Rated Maximum Junction Temperature
- Low Input Capacitance
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Available
RoHS* COMPLIANT

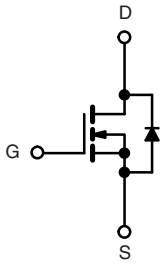
**TO-252**




Drain Connected to Tab

Top View

**Ordering Information:**
SUD35N05-26L-E3 (Lead (Pb)-free)




N-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25 °C, unless otherwise noted) | | | | |
|---|---|---|---|---|
| **Parameter** | | **Symbol** | **Limit** | **Unit** |
| Drain-Source Voltage | | $V_{DS}$ | 55 | V |
| Gate-Source Voltage | | $V_{GS}$ | ± 20 | |
| Continuous Drain Current ($T_J$ = 175 °C)[b] | $T_C$ = 25 °C | $I_D$ | 35 | A |
| | $T_C$ = 100 °C | | 25 | |
| Pulsed Drain Current | | $I_{DM}$ | 80 | |
| Continuous Source Current (Diode Conduction)[a] | | $I_S$ | 35 | |
| Maximum Power Dissipation | $T_C$ = 25 °C | $P_D$ | 50[c] | W |
| | $T_A$ = 25 °C | | 7.5[b] | |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{stg}$ | - 55 to 175 | °C |

| THERMAL RESISTANCE RATINGS | | | | | |
|---|---|---|---|---|---|
| **Parameter** | | **Symbol** | **Typical** | **Maximum** | **Unit** |
| Junction-to-Ambient[b] | t ≤ 10 s | $R_{thJA}$ | 17 | 20 | °C/W |
| | Steady State | | 50 | 60 | |
| Junction-to-Case | | $R_{thJC}$ | 2.5 | 3 | |
| Junction-to-Lead | | $R_{thJL}$ | 5 | 6 | |

Notes:
a. Package limited.
b. Surface mounted on 1" x1" FR4 board, t ≤ 10 s.
c. See SOA curve for voltage derating.

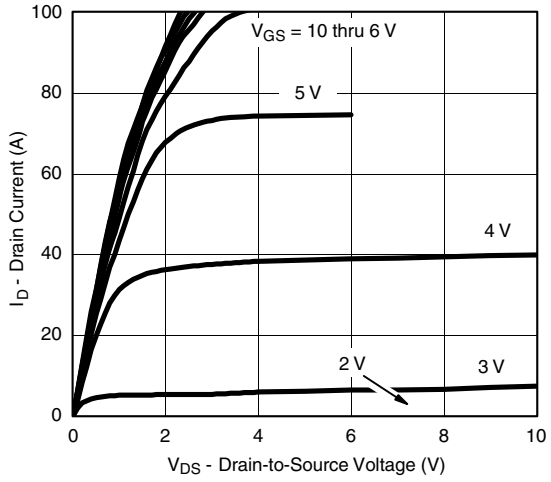
* Pb containing terminations are not RoHS compliant, exemptions may apply.

| **SPECIFICATIONS** ($T_J$ = 25 °C, unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **Parameter** | **Symbol** | **Test Conditions** | **Min.** | **Typ[a]** | **Max.** | **Unit** |
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{BR}$ | $V_{GS}$ = 0 V, $I_D$ = 250 µA | 55 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250 µA | 1 | | | |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = ± 20 V | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 44 V, $V_{GS}$ = 0 V | | | 1 | µA |
| | | $V_{DS}$ = 44 V, $V_{GS}$ = 0 V, $T_J$ = 125 °C | | | 50 | |
| On-State Drain Current[b] | $I_{D(on)}$ | $V_{DS}$ = 5 V, $V_{GS}$ = 5 V | 35 | | | A |
| Drain-Source On-State Resistance[b] | $R_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ = 20 A | | 0.0165 | 0.0200 | Ω |
| | | $V_{GS}$ = 10 V, $I_D$ = 10 A, $T_J$ = 125 °C | | | 0.0350 | |
| | | $V_{GS}$ = 4.5 V, $I_D$ = 15 A | | 0.0215 | 0.0260 | |
| Forward Transconductance[b] | $g_{fs}$ | $V_{DS}$ = 15 V, $I_D$ = 20 A | | 25 | | S |
| **Dynamic[a]** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0 V, $V_{DS}$ = 25 V, f = 1 MHz | | 885 | | pF |
| Output Capacitance | $C_{oss}$ | | | 185 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 80 | | |
| Total Gate Charge[c] | $Q_g$ | $V_{DS}$ = 25 V, $V_{GS}$ = 5 V, $I_D$ = 35 A | | 10.5 | 13 | nC |
| Gate-Source Charge[c] | $Q_{gs}$ | | | 4 | | |
| Gate-Drain Charge[c] | $Q_{gd}$ | | | 4.8 | | |
| Turn-On Delay Time[c] | $t_{d(on)}$ | $V_{DD}$ = 25 V, $R_L$ = 0.3 Ω<br>$I_D$ ≅ 35 A, $V_{GEN}$ = 10 V, $R_G$ = 2.5 Ω | | 5 | 8 | ns |
| Rise Time[c] | $t_r$ | | | 18 | 30 | |
| Turn-Off Delay Time[c] | $t_{d(off)}$ | | | 20 | 30 | |
| Fall Time[c] | $t_f$ | | | 100 | 150 | |
| **Source-Drain Diode Ratings and Characteristic** ($T_C$ = 25 °C) | | | | | | |
| Continuous Current | $I_S$ | | | | 35 | A |
| Pulsed Current | $I_{SM}$ | | | | 80 | |
| Diode Forward Voltage[b] | $V_{SD}$ | $I_F$ = 80 A, $V_{GS}$ = 0 V | | | 1.5 | V |
| Source-Drain Reverse Recovery Time | $t_{rr}$ | $I_F$ = 35 A, di/dt = 100 A/µs | | 25 | 40 | ns |

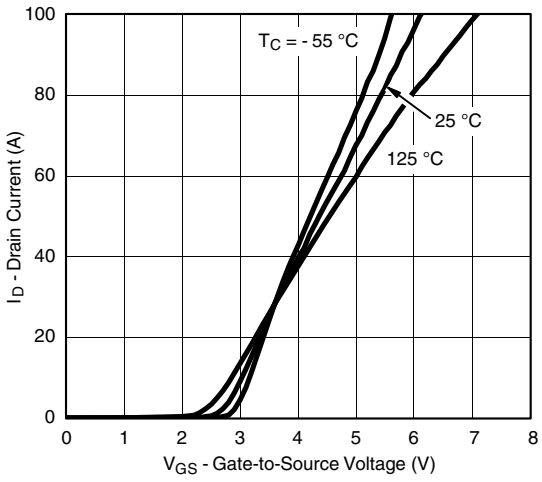
Notes:
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
c. Independent of operating temperature.

*Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.*

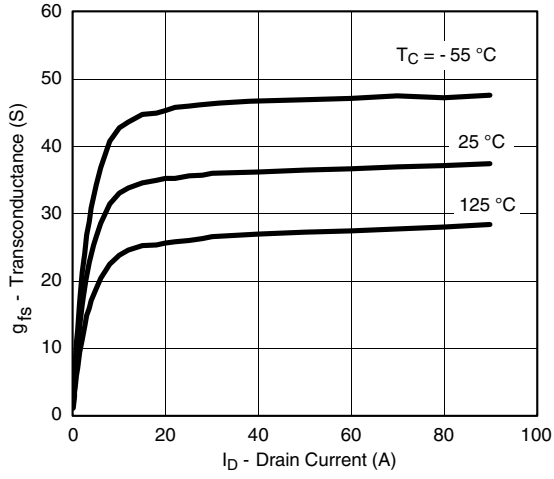
## TYPICAL CHARACTERISTICS (25 °C unless noted)



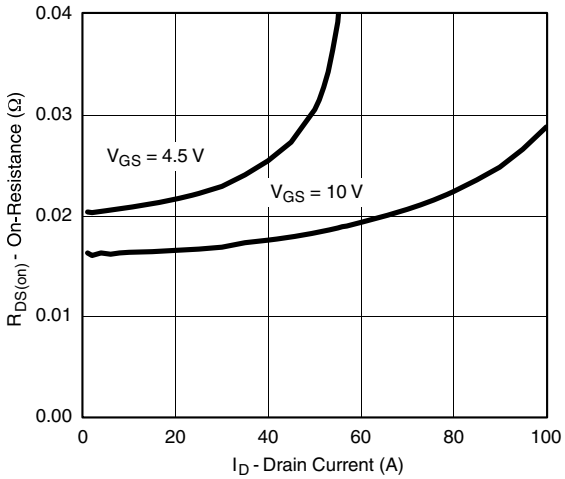

**Output Characteristics**



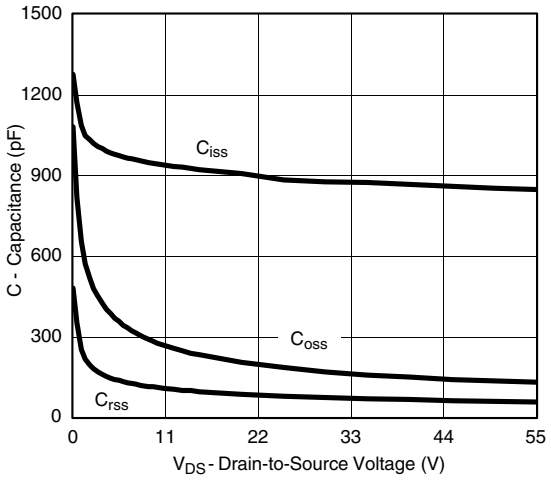

**Transfer Characteristics**



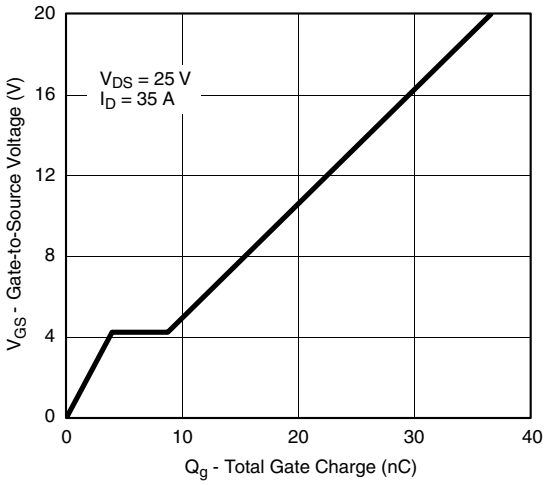

**Transconductance**




**On-Resistance vs. Drain Current**

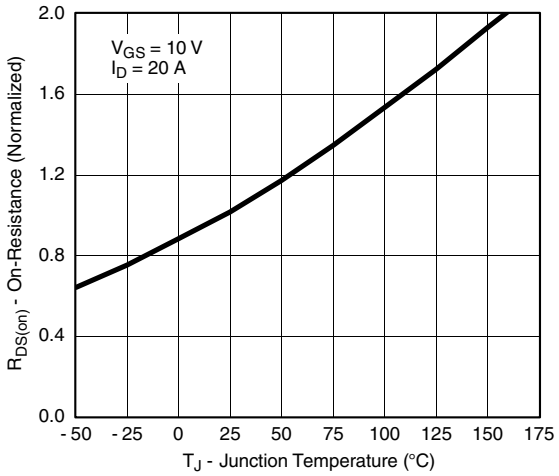



**Capacitance**

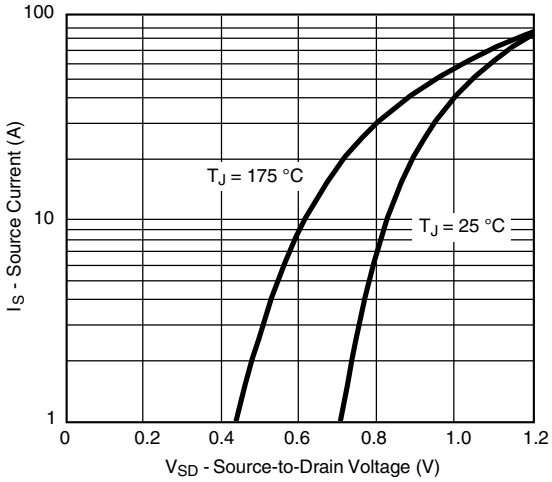



**Gate Charge**

## TYPICAL CHARACTERISTICS (25 °C unless noted)

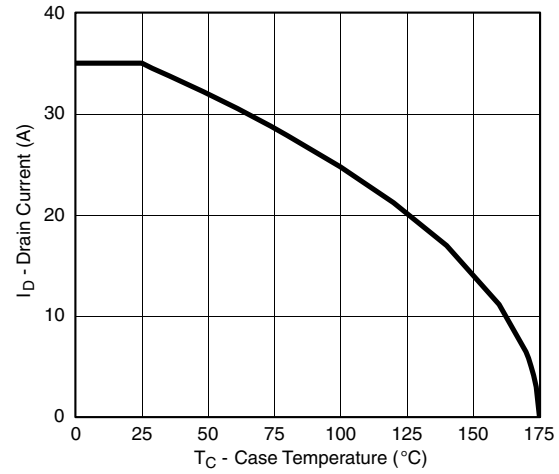



**On-Resistance vs. Junction Temperature**

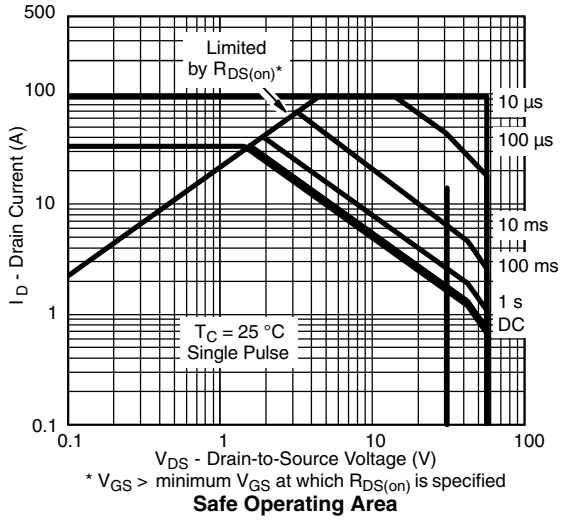



**Source-Drain Diode Forward Voltage**

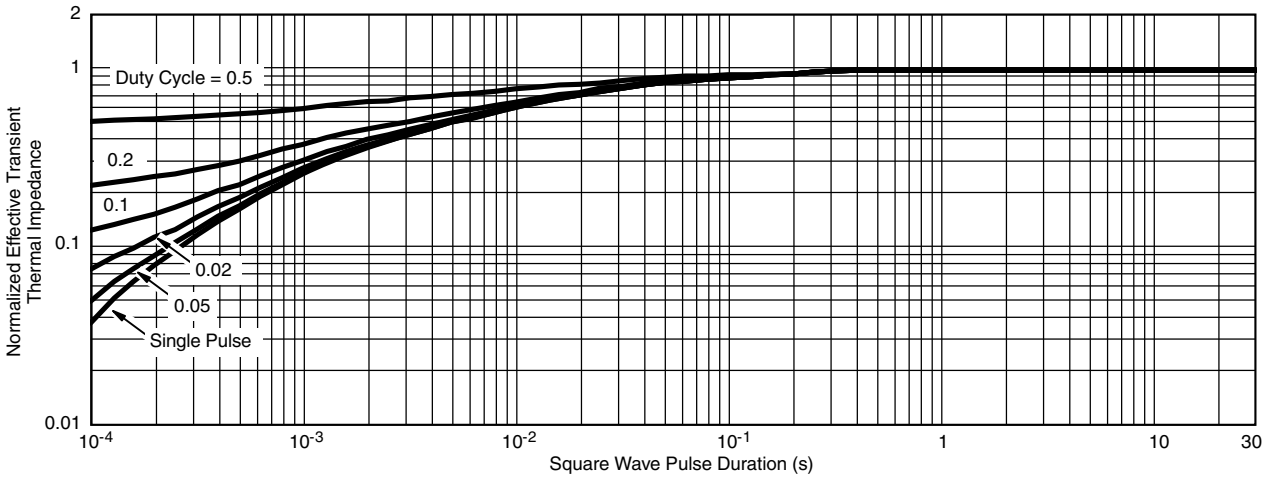
## THERMAL RATINGS




**Max. Avalanche and Drain Current vs. Case Temperature**




**Safe Operating Area**




**Normalized Thermal Transient Impedance, Junction-to-Case**

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